Amendments to the Claims

This listing of claims will replace all prior listings of claims in the application.

Listing of Claims

1.-28. (Canceled)

29. (New) A method for culling small objects in a system for shading 3-dimensional computer graphics images comprising the steps of:

subdividing a display on which an image is to be viewed into a plurality of rectangular areas;

for each rectangular area deriving a list of objects in the image which may be visible in that rectangular area;

using the list of objects to determine how the rectangular area should be shaded for display;

characterized in that the step of deriving a list of objects comprises the step of;

determining maximum and minimum values for each object in x and y directions;

for each object in the image, determining a bounding box from the maximum and minimum values of the x and y coordinates of the object;

determining a set of pixel sampling points from the maximum and minimum values;

determining whether or not a bounding box surrounding the object covers any of the pixel sampling points;

culling the object if the bounding box misses all the pixel sampling points;

testing each sampling point against each edge of the object;

determining from the test performed whether or not the object covers any pixel sampling point; and

adding or rejecting the object from the list in dependence on the result of the determination.

30. (New) A method according to claim 29, including the step of determining whether or not the sampling points are spread by more than 1 x 1 pixel and not testing the object for culling if the sampling points exceed this limit.

31. (New) A method according to claim 29, including the step of, for each object, selecting only those rectangular areas which fall at least partially within the object's bounding box when determining whether or not that object is to be added to the list for a rectangular area.

32. (New) An apparatus for culling small objects in a system for shading a three-dimensional computer graphics image comprising:

means for subdividing a display on which the image is to be viewed into a plurality of rectangular areas;

means for deriving for each rectangular area a list of objects in the image which may be visible in that rectangular area;

means for determining how the rectangular area should be shaded for display by using the list of objects;

characterized in that the means for deriving a list of object comprises;

means for determining maximum and minimum values for each object in x and y directions;

for each object in the image determining a bounding box from the maximum and minimum values in the x and y directions;

means for determining a set of pixel sampling points from the maximum and minimum values;

means for determining whether or not the bounding box surrounding the object covers any of the pixel sampling points; and

means for culling the object if it misses all the pixel sampling points;

means for testing each pixel sampling point against each edge of the object;

means for determining from the test performed by the testing means whether or not the object covers any sampling points; and

means for adding or rejecting the object from the list in dependence on the result of the determination.

33. (New) An apparatus according to claim 32, including means for determining whether or not the sampling points are spread by more than 1 x 1 pixel in the x and y directions and not testing the object for culling if the sampling points exceed this limit.

34. (New) An apparatus according to claim 32, including means for selecting for each object only those rectangular areas which fall at least partially within the bounding box of the object when determining whether or not that object is to be added to the list for a rectangular area.

35. (New) An apparatus according to claim 32, including means for testing each sampling point against each edge of the object;

means for determining from the test performed by the testing means whether or not the object covers any sampling point; and

means for adding or rejecting the object from the list in dependence on the result of the determination.